Shropshire Botanical Society Newsletter, Autumn 2015

Epilobium montanum Broad-leaved Willowherb seed capsule opening, photo M.Cousins, 2015

Shropshire Botanical Society Newsletter No.31

Contents

	Page
Society Matters	3
Plant Records 2015	4
Botanical Change in Shropshire	5
Epilobium (Willowherbs) in Shropshire	9
Galeopsis angustifolia Red Hemp-nettle in Shropshire, just…	15
Ten Targets for Conservation in Shropshire - an Update	16
What is happening at Catherton Common	20
Plant Introductions at Llynclys Quarry	25
The Location of Cwm Floyd	29
List of Members (with renewal dates)	31

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Past copies of the newsletter are available as pdfs from the Shropshire Botanical Society website: http://www.bsbi.org.uk/shropshire.html

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Our thanks go to the Shropshire Wildlife Trust and the Field Studies Council for their generous support of our society. Both organisations support the work of the society in recognition of the importance of the contribution we make to understanding Shropshire botany.

Society Matters

Mags Cousins

If you were able to attend the launch of the Flora and Vegetation of Shropshire in March this year, you will know that it was the culmination of many years' hard work and a great celebration. In this edition of the newsletter Ian Trueman gives an insight into some of the findings of the survey work carried out for producing the Flora, which makes for sobering reading but with some areas for optimism. We also have an update of the top ten targets for conservation in Shropshire, five years after these were first proposed; reports on establishing species at Llynclys Quarry; the status and ecology of the rare *Galeopsis angustifolia* Red Hemp-nettle in Shropshire; another view of the characterisation of the heathland at Catherton Common and a closer look at the difficult group *Epilobium*.

If you still need to purchase your copy of the Flora and Vegetation of Shropshire or have Christmas presents in mind, please send your order at £35 per book to the Treasurer Sue Townsend email: sue.t@field-studies-council.org, Tel. 07977 574980. You will be able to collect your copies at the Christmas meeting and thereby **not** incur the £4.40 postage charge, Prior purchase will also help the team plan the number of copies to bring on the day.

Very many thanks to Mark Duffell who has stepped down from the role of Membership Secretary as, amongst other things, he is very busy teaching identification classes, as many of you will know from having attended his courses this year! So the committee need help with memberships, the role mostly involves receiving money from members, what's not to like?! For the time being payments can be sent to the Treasurer Sue Townsend, at No 4, Thatched Cottages, Shrawardine, SY4 1AE, see inside back cover for renewal dates of memberships.

Winter Meeting, Saturday 12th December 2015, 2–4 pm.

Come and join us for a festive social and a topical talk at our usual venue Preston Montford Field Studies Centre, Montford Bridge, Shrewsbury, SY4 1DX.

Speaker Dr Jonathan Briggs: "The Mysteries of Mistletoe"

Jonathan Briggs studied Botany at the University of Bristol and Industrial Archaeology at the Ironbridge campus of the University of Birmingham. He runs an ecological consultancy based in Gloucestershire with interests in parasitic plants, ecology of historic navigation canals, the ecology and conservation of unusual plant and insect species plus some industrial and landscape archaeology.

Spring Meeting 2-4pm, Saturday 9th April 2016, also at our usual venue Preston Montford Field Studies Centre, Montford Bridge, Shrewsbury, SY4 1DX. Our very own Prof Ian Trueman will give a talk on "Changes in the Shropshire Flora since Sinker".

Plant Records 2015

Alex Lockton

Not many exciting finds to report so far this year, which is what is to be expected when a new Flora comes out. Having said that, however, there is plenty of recording going on. Shropshire Wildlife Trust has been very energetic in surveying Wildlife Sites, which is great for getting lists for under-recorded areas, often with limited public access; and Paul Green has been working for SEDN recording in some of the less well-known South Shropshire Hills. We shall have as many records as ever, and they all contribute towards our aim of getting better coverage at the monad (1 km) scale.

The other main source of data at the moment is historical. We have two complete Floras of the county to computerise – one by William Beckwith, compiled before his death in 1892, and one by Richard Benson and William Hamilton, compiled in about 1909. There are about 3,000 pages in these two documents, and each one takes a couple of hours to compile. The job is about 50% completed. When it is done it will give us a historical dataset for this county that appears to be unparalleled elsewhere.

New records

Malva arborea (L.) Webb & Berthel., Tree-mallow. Spotted by Mark Duffell in the central reservation of the A5 at Churncote, SJ4413, 25th March 2015. This is a first for the county. It is a bit tricky to photograph *in situ*, so here is a picture of it on Whitstable Beach.

Malva arborea

Vaccinium x intermedium

Vaccinium x intermedium Ruthe (*myrtillus* x *vitis-idaea*), Hybrid Bilberry, has been known on the Stiperstones since 1968, when it was first recorded by Charles Sinker, 'by the ridge path and at Manstone Rock' (SJ370995). It was later refound by Kate Thorne, but doubt about its identity had been expressed by several people at a Recorders' Conference, so we have been a bit uncertain about it since then. Now Kate has provided photographs which are confirmed by Clive Stace, 'without any doubt,' so we apologise to Kate for calling into question her original identification… It is recorded at SJ381011, SO356968 and SO366982.

Botanical Change in Shropshire

Ian Trueman

The publication of *The Flora and Vegetation of Shropshire* in 2015 allowed a comparison with the *Ecological Flora of the Shropshire Region*, published in 1985. This was attempted in the new Flora and I have been asked to distil out some of the main points here.

There are some problems in making a direct comparison between the two Floras. We had to entirely omit the 200 'very common' species which were not recorded to tetrad level in the 1985 Flora, also some particularly unevenly recorded microspecies. In the BSBI Atlas, changes in an individual species were assessed against the background of the average change in order to reduce the affect of different recorders. We noted that the size of the comparable databases in the two studies (63,326 tetrad records in 1985 and 64,241 in 2015) was very similar and we used the raw data throughout.

It is fashionable to contrast the native flora with the anciently (archaeophyte) and more recently (neophyte) introduced floras. In Shropshire, all three types seem to be increasing in numbers of species as we get to know the flora better. However, a better impression of the overall frequency of the types is given if each species is multiplied by the number of tetrads in which it has been recorded. The total number of tetrad records of *native* tetrad records has decreased by about 4% between the two Floras, *archaeophytes* by 12% and *neophytes* have increased by 60%.

Most of the archaeophytes are ancient weeds of cultivation and modern agriculture has largely defeated them. Even so, the archaeophytes *Galeopsis angustifolia*, *Legousia hybrida* and *Ranunculus arvensis*, all thought extinct here by 1985, have been rediscovered since 1985. I think that they will be difficult to eliminate altogether. Neophytes have been 'invading' Britain and Ireland since 1500 AD, but modern mobility seems to have increased this process tremendously. The list of neophytes which were rare or absent in Sinker's Flora and are now common or even abundant is quite startling. The classical invasive aliens *Fallopia japonica* Japanese Knotweed and *Impatiens glandulifera* Indian Balsam were both pretty frequent by 1985 but are now joined by many other plants such as *Acer platanoides* Norway Maple, *Buddleja davidii* Butterfly-bush, *Prunus laurocerasus* Cherry Laurel, *Cotoneaster* species, *Lamiastrum galeobdolon* subsp. *argentatum* Variegated Yellow Archangel and *Hyacinthoides* x *massartiana* Hybrid Bluebell which were rare or absent or at least unrecorded in the 1985 Flora but are now all very frequently recorded. It is true that the modern botanist is more likely to record such plants than our more fastidious predecessors but most of them are now very familiar in rather disturbed communities, and a few even in more stable and characteristic communities! It is however possible to exaggerate the speed and extent of these trends. The flora is still overwhelmingly native (dropping from 78% to 74% of tetrad records between the two Floras; neophytes still only accounting for 14%) but the trends are clear.

Species extinctions from the vice county continue, although not at an obviously accelerating pace, and going down the list of important native and archaeophyte species feared extinct in the last *Rare Plants of Shropshire* in 2005 it is somewhat heartening to think that *Hippuris vulgaris* Mare's-tail, *Cardamine impatiens* Narrow-leaved Bitter-cress, *Hordeum secalinum* Meadow Barley, *Limosella aquatica* Mudwort, *Potamogeton lucens* Shining Pondweed, and *Hymenophyllum wilsonii* Wilson's Filmy-fern have all been seen here since then. Most of the species which have 'stayed extinct', such as *Carex limosa* Bog-sedge, *Sparganium natans* Least Bur-reed, *Baldellia ranunculoides* Lesser Water-plantain, *Drosera anglica* Great Sundew and *Drosera intermedia* Oblong-leaved Sundew have been of plants long known from a single or a

very small numbers of lowland sites and many of these losses reflect the apparently inexorable eutrophication and inappropriate management of lowland, and especially wetland and open water, habitats. Nevertheless, in the Flora we were able to list 88 native species with a long history as members of recognised vegetation which have five or fewer tetrad records since 1985 and many of these vulnerable species have clearly decreased in frequency. One or two, such as *Gentianella campestris* Field Gentian, may already be extinct here. How long will it be before all these species are found at a single site? Most habitats are represented but open water, wetland and other non-wooded habitats predominate.

Most of the 88 species listed are, not unexpectedly, axiophytes. Change in the frequency of axiophyte species is by definition going to be important in nature conservation terms and although a minority of axiophytes (150) show negative percentage changes in tetrad frequency between the two Floras this amounts to 3,055 less tetrads and those showing positive or no change (193) have only added 1,687 tetrads, so the trend in axiophyte richness is downwards. It is also probable that most of the increases are in detection rather than in propagation. Such species are usually lousy colonist, also almost by definition. Nevertheless not all the increases can be easily explained away and in particular big increases in *Dactylorhiza praetermissa* Southern Marsh-orchid, *Empetrum nigrum* Crowberry, *Filago minima* Small Cudweed, *Ophrys apifera* Bee Orchid, *Origanum vulgare* Marjoram, *Orobanche rapum-genistae* Greater Broomrape, and *Ranunculus parviflorus* Small-flowered Buttercup may have positive ecological explanations.

Many relatively common, mostly non-axiophyte species show considerable change in tetrad numbers between the two Flora surveys. Some wetland and open water species such as *Senecio aquaticus* Marsh Ragwort, *Ranunculus sceleratus* Celery-leaved Buttercup and *Alisma plantago-aquatica* Water-plantain have over a hundred tetrads records fewer in the new Flora. Species predominantly associated with other types of predominantly non-wooded vegetation show similar huge losses. Top (or bottom!) scores go to *Cruciata laevipes* Crosswort which has 263 fewer tetrad records and *Linaria vulgaris* Common Toadflax with 200 fewer. A total of 39 species have over 100 tetrads fewer and a further 52 have over 50 fewer. This includes *Primula veris* Cowslip, *Betonica officinalis* Betony and *Knautia arvensis* Field Scabious, but also representatives of most habitat types including a few heathland species such as *Calluna vulgaris* Heather and *Vaccinium myrtillus* Bilberry. There are also large increases in equivalent numbers of species. Many of these, such as *Epilobium obscurum* Short-fruited Willowherb and *Carex pilulifera* Pill Sedge, are probably in part the result of better descriptions in the Floras (and the increased provision of biological recording courses!) but the overwhelming majority are neophytes or natives known to be escaping from garden cultivation. One possible exception from these explanations is *Euonymus europaeus* Spindle, native in our hedgerows and woodlands, which has 61 extra tetrad records.

Much can be learned by attempting to analyse and map the plant data set as a whole. We used two main techniques to achieve this in the change chapter: coincidence mapping and multivariate analysis. We produced coincidence maps of the complete set of axiophyte species for the two floras, distinguishing between tetrads according to the number of axiophytes recorded. These maps show a very similar distribution and numbers in the two surveys, especially in the richer areas. The big changes are in the poorer areas. A much larger number of tetrads (643) have low scores of fewer than 20 axiophytes (541 in the old Flora) and a much smaller number (165) have modest numbers of 20-39 axiophytes in the new Flora (361 in the old Flora). These differences are significant statistically and also, we think, ecologically. The maps show a widespread reduction in tetrads with 20-39 axiophytes where they previously surrounded and linked the rich areas throughout the county, perhaps particularly in the south.

We also undertook and mapped a computer analysis of the complete data set - axiophytes and all the rest. This allowed us to divide the tetrads into types according to the species recorded in them and to map the types. Three main floristic zones were distinguished. Most distinct is the zone in which the tetrads are characterised by the significant presence of heathland species. This zone encompasses all our upland areas plus the acid-soiled parts of the Wyre Forest and the mosslands of the north. In the maps there are some small signs of contraction in the area of this zone since the 1985 Flora, especially in the Clun Forest, but the most obvious change is an increase in the most desirable types of tetrad within the zone, characterised by such plants as *Eriophorum angustifolium* Common Cottongrass and *Drosera rotundifolia* Round-leaved Sundew. Probably these areas are better recorded now but one big change since the early 1980s has been the amount of the uplands which are now managed for nature conservation. This may already be having a positive effect, for example where the relaxation of grazing pressure in the Long Mynd has revealed more diversity in the mires and grasslands.

In the lowlands, the analysis separates two main types of tetrad. It distinguishes most of the landscape north of the River Severn which forms the Shropshire plain from the more dissected landscape with older geology south of the Severn and in the Welsh borders. The zone encompassing the intensively farmed North Shropshire Plain still includes many tetrads rich in the wetland species associated with the meres, rivers and canals of the region. There are signs of contraction in the number of these tetrads with rich wetland especially in the Whitchurch area, possibly mainly due to the loss of small fragments which were so enthusiastically drained and 'improved' in the 1970s and 1980s.

The zone which comprises most of the south and central lowlands and also the lowland parts of the Welsh borders are largely characterised by the persistence of an ancient woodland flora. The richest grouping distinguished within this landscape zone is mainly associated with the core areas of the Oswestry and Wenlock limestones and this type is not strongly contracting in size. The rest show a strong trend between relatively species-poor tetrads and ones characterised by a wide range of species including *Cruciata laevipes* and many of the other species shown to be decreasing in our analysis of the individual species data. The complete list of species preferentially associated with this species-rich end of the trend is shown in appendix 4 of the change chapter. A wide range of species from most habitat types are included in this list, including some choice woodland species, but large numbers of the species are from a range of more open habitats, mostly on dry soils. Over half of them are axiophytes. This trend strongly differentiates between the two Floras – these richer tetrads were common in the 1985 Flora and are now quite rare. The maps of the ancient woodland landscape type show the *Cruciata laevipes* type abundantly surrounding the richest core areas and forming connections between them in the 1985 map, but largely eliminated in the 2015 map in parts of the south.

Probably this deleterious trend between the two Floras reflects a general deterioration in diversity in 'average' tetrads, but many of the species which are becoming less common are found on road verges, hedgebanks and waysides generally. *Cruciata laevipes* is even characteristic of such marginal habitats where the vegetation is short and soils are modestly infertile. Many of the other species associated with this trend, such as *Lathyrus linifolius* Bitter-vetch (see photo below), *Linaria vulgaris*, *Primula veris*, *Knautia arvensis*, can often be found under similar conditions. The implication is that these marginal habitats are losing their diversity due to increases in soil fertility and neglect of management. As a result many develop vegetation dominated by a few tall herbs and grasses such as *Anthriscus sylvestis* Cow Parsley and *Arrhenatherum elatius* False Oat-grass, or are invaded by Brambles and tree seedlings, either way completely swamping the pre-existing diversity. We have all seen examples of this happening.

The implication of the species trends and the maps of the axiophyte analysis and the multivariate analysis are the same. We may have been modestly successful in protecting our best sites, although the threat remains, but the moderately rich 'bits in between', are continuing to deteriorate relentlessly. This process of fragmentation probably makes the richer areas more vulnerable in the long run. The solution proposed (for example by Sir John Lawton in his 2010 report to government) is landscape conservation. The Shropshire Flora data show how far we still have to go to recreate a more coherent, more continuous and hence much more resilient 'ecological network' or even just to stop its deterioration. We have to protect and nurture our core areas, but we must also have a mind to all the much more modestly rich linking areas in between our best sites. Apart from their value in landscape coherence, these waysides are where most of the public see botanical diversity and where I and doubtless many others were first struck by the beauty and complexity of our flora. As Charles Sinker said in the 1985 Flora, 'we must not lightly let them go'.

Roadside verge near Hobarris Wood, south Shropshire with *Lathyrus linifolius* Bitter-vetch, photo M.Cousins, 2015

Epilobium (Willowherbs) in Shropshire

Mags Cousins

The genus *Epilobium* is certainly not easy, needing careful attention to the full range of characters and ultimately verification from the county recorder and the referee for all but the commonest species. The plasticity of the true species and widespread hybridisation can cause problems in identification. Possibly the worst confusion arises when you think you have a hybrid but you don't. Just because it is difficult to place a plant in a species does not mean it is a hybrid!

Determining a true species means looking at the whole range of proven characters, in the case of *Epilobium*, especially the hairs. The indumentum (Latin, literally: "garment") is a covering of trichomes (fine "hairs") on a plant and entire keys have been devised for European *Epilobium* based on trichomes alone. The BSBI Plant Crib for *Epilobium* (Rich and Jermy 1998) stresses the importance of examining the quality of the indumentum.

Looking at the whole range of characters, I have, for Shropshire *Epilobium*, compiled descriptions and details from keys already available. Others have produced their own keys or tables of characters to help sort out this genus, which are very helpful, such as the one for Hampshire Willowherbs (Rand, 2013) which includes just two that don't occur in Shropshire.

There are 10 species of *Epilobium* so far recorded in Shropshire and eleven hybrids (see Table 1). There are very few records of the hybrids (for records see SEDN and Lockton and Whild, 2015), mostly made or determined by G D Kitchener who is the BSBI (Botanical Society for Britain and Ireland) county recorder for Kent and referee for Willowherbs. His records were mainly in 2003 and mostly from the same few locations – Eaton Manor and Blists Hill in particular. No doubt there are many more to be found. I have not included hybrids here, again there are excellent accounts and keys, such as the BSBI Plant Crib (1998) and Sell and Murrell (2009).

The characters (see Table 2)

Epilobium have 4 sepals, 4 petals, 8 stamens, a single style and the stigma may be club shaped or 4 lobed according to which species. Five of Shropshire's true species have clubbed stigmas and 5 have lobed ones, so if flowers are available this is a helpful character.

Epilobium are perennial but this is not always obvious as even young plants can flower and in some species the flowering stems arise from leafy rosettes which were on last year's stolons but these have long since withered. In this case, the plants only have insubstantial roots as if they were annuals, for example *Epilobium palustre*, Marsh Willowherb. The means by which the plants overwinter are known as the perennating structures and the presence, length, form and location of buds and rosettes on the stolons are all important characters.

The shape of the stem – round or with four angles – is helpful, though in *E. roseum* two of the angles can be indistinct.

Hairiness is very important: the density of the covering; location eg upper or lower stem, leaf surface or veins; hairs spreading or appressed; glandular or not; even the length of the hairs.

Leaf shape, the presence of teeth, the length of the leaf stalk if present and how the base of the leaf narrows or not are all important features.

Flower size is helpful but variable, and colour too – whilst generally pink the white ones can help to pinpoint a species, eg *E. roseum* and *E. ciliatum* have flowers that start white and turn pink upon fertilisation.

Species	**Status in Shropshire**	**Habitats**
E. brunnescens New Zealand Willowherb	Neophyte, local, increasing	Prefers damp barish gd, woodland rides, flushes, streams South Shrops
E. ciliatum American Willowherb	Neophyte, widespread, increasing	Waste gd, wetlands
E. hirsutum Great Willowherb	Native, widespread, stable	Common all wetlands except the most acid, also riverbanks, waste gd, arable.
E. montanum Broad-leaved Willowherb	Native, widespread, stable	Woods, swamps, grassland
E. obscurum Short-fruited Willowherb	Native, widespread, stable	Wetlands, wet wds, arable, waste gd
E. palustre Marsh Willowherb	Native axiophyte, local, decreasing	Swamps and fens
E. parviflorum Hoary Willowherb	Native, widespread, stable	Damp bare gd, arable fields, swamps, pond margins, river bks
E. *roseum* Pale Willowherb	Native, scattered, stable	Gardens, river bks, waste gd, walls
E. tetragonum Square-stalked Willowherb	Native, scattered, stable	Wet wds, swamps, arable fields
E. lanceolatum Spear-leaved Willowherb	First record 2014	Likes dry sunny places, roadside in Shrewsbury
Hybrid	**Parents**	**Records in Shropshire**
Epilobium x *aggregatum*	*montanum* x *obscurum*	One record 1962
Epilobium x *dacicum*	*parviflorum* x *obscurum*	First record 1889 and in fields at Eaton Manor, 2003
Epilobium x *floridulum*	*parviflorum* x *ciliatum*	Three records in 2003, Blists Hill, Criftin Quarry and Eaton Manor
Epilobium x *interjectum*	*montanum* x *ciliatum*	1994 Pant, and 2003 Acton Scott and Church Stretton
Epilobium x *limosum*	*parviflorum* x *montanum*	One record 2003, Blists Hill
Epilobium x interjectum	*tetragonum* x *ciliatum*	Two records 2003, Blists Hill and Eaton Manor
Epilobium x *novae-civitatis*	*hirsutum* x *ciliatum*	One record 2003, field margin Eaton

		Manor
Epilobium x *persicinum*	*parviflorum* x *roseum*	1897 and 1907 garden in Meole Brace
Epilobium x *rivulare*	*parviflorum* x *palustre*	Old River Bed 2008
Epilobium x *subhirsutum*	*hirsutum* x *parviflorum*	Record from 1955 Llynclys
Epilobium x *vicinum*	*obscurum* x *ciliatum*	Eaton Manor 2003, Brown Moss 2006 and Lower Netchwood 2009

Table 1 *Epilobium* true species and hybrids in Shropshire (notes on distribution from Lockton and Whild, 2015)

Notes on *Epilobium* species in Shropshire

***Epilobium hirsutum* Great Willowherb** This species being large and shaggily hairy when mature is distinctive BUT the rosettes of leaves on young shoots early in the year can be deceptive as they are more or less hairless and shiny. It is tolerant of nutrient enrichment and the strong stolons enable it to thrive in vegetation-choked wetlands.

***Epilobium parviflorum* Hoary Willowherb** This has softly hairy upper parts, similar to, but smaller than *E. hirsutum* but the leaves are not decurrent. The hairiness on the leaves often becomes matted as the name suggests. Widespread but prefers barish ground in wet conditions, including arable.

***Epilobium montanum* Broad-leaved Willowherb** The key features are a 4-lobed stigma and broad shortly-stalked leaves which are rounded at the base, sometimes in whorls of three. It is very widespread and frequent in wet woodlands liking damp shady places but can occur as a weed of gardens and arable.

***Epilobium lanceolatum* Spear-leaved Willowherb** Unbranched or very simply branched stems, 4-lobed stigma, leaves narrowed to a stalk and likes drier places, especially waysides, walls and waste ground. Mostly a southern species in Britain with only one record in Shropshire so far from a roadside in Shrewsbury by Whild in 2014.

***Epilobium tetragonum* Square-stalked Willowherb** Of all the species with lines or ridges on the stem they are most prominent in this one, especially in the lower half, giving it the appearance of being square-stemmed. There are no glandular hairs anywhere but it may have crisped hairs on the stem. Occurs in a variety of habitats, including arable, but more common in wetlands. Shropshire records have not been differentiated into the sub species but Ssp. *lamyi* is rather rare in Southern Britain so ours are most likely Ssp. *tetragonum*.

***Epilobium obscurum* Short-fruited Willowherb** The hairs on this species are glandular only on the sepals, the tube at their base and sometimes on the developing fruit. Widespread but scattered in Shropshire in a variety of habitats including the meres and mosses. It can be confused with *E. tetragonum*, the BSBI Plant Crib (2008) provides a description of both, and the BSBI Recorders' Conference April 2015 provided notes on these two species including the two sub species of *E. tetragonum*.

Epilobium palustre **Marsh Willowherb** The only axiophyte *Epilobium* in Shropshire, being a more specialist species occurring in low nutrient wetlands such as around the meres, at Rhos Fiddle, Cramer Gutter and in flushes on the Long Mynd and sometimes also in open woodland. The distribution shows a marked concentration in south west Shropshire. Although it can reach 60 cm, it is generally small, neat and little branched. The upper stem can be sparsely hairy but usually lacking glandular hairs and often has a droopy tip as it comes into flower.

Epilobium ciliatum **American Willowherb** This was first collected in Britain, in Leicestershire, in 1891 and spread rapidly, reaching Shropshire by the 1960s. It is one of the taller species, often well-branched. It is conspicuously glandular on the upper stem, sepals, calyx-tube and fruit. Plants perennate by means of leafy rosettes, which develop at the base of the stem and produce their own adventitious root systems independent of the parent plant. It often behaves as an annual, relying on its abundant seed production for survival (Preston, 1998), and this has probably aided its rapid dispersal.

Epilobium roseum **Pale Willowherb** The comparatively long leaf stalks are distinctive and help to distinguish it from *E. ciliatum* which is similarly glandular hairy on upper stem, sepals, calyx tube and fruit and both have a club shaped stigma and flowers white turning pink. It likes bare, damp ground and has been recorded consistently from Church Stretton since 1907 but elsewhere appears transient and there are far fewer records for this species in Shropshire than for *E. ciliatum*.

Epilobium brunnescens **New Zealand Willowherb** This native of New Zealand is distinctive for its mat forming, low, procumbent growth and small rounded leaves (see photo back cover), quite unlike our other *Epilobium*. Records so far are from South Shropshire, with the first record in 1968 at Brown Clee, and now also Long Mynd, Hopesay Hill, Black Hill, Titterstone Clee and Wyre Forest.

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Table 2: Characters of *Epilobium* in Shropshire

Species	**Stigma**	**Stem**	**Hairiness**	**Leaves**	**Leaf stalk**	**Flowers**	**Growth Form**
Epilobium brunnescens	4 lobes		Two rows of sparse minute glandular and non glandular hairs on stem	Lvs orbicular, often purplish underneath, with a few blunt teeth	Petioles 0.5-3 mm	Solitary, petals 2.5-4 mm, white to pale pink	Mat forming, low growing, stems wholly procumbent
Epilobium ciliatum	Club shaped undivided	4 raised ridges, or round	Sparsely to abundantly hairy, with appressed non glandular hairs and patent glandular hairs	Lvs hairless exc for minute cilia, rounded to subcordate at base	Petiole 1.5-4 mm	Petals 3-6 mm, pinkish-purple, often white turning pink	No stolons but perennate by more or less sessile leaf-rosettes.
Epilobium hirsutum	4 lobes that arch back	Round	Dense, long spreading hairs on stems and upper leaves (basal hairless), with and w/o glands	Clasping, pointed, stalkless	No petiole	Petals (6)10-16(19) mm, deep purple pink, sometimes white	Stems erect and stout to 1.8 m. Long, thick, fleshy stolons
Epilobium montanum	4 lobes	Round	Sparsely hairy, with more or less appressed non glandular hairs and patent glandular hairs	Lvs distinctly toothed, rounded at base	Short petiole 2-6 mm	Petals 8-10 mm, pink, sometimes white	Overwintering by subsessile leafy buds
Epilobium obscurum	Club shaped	4 raised ridges	Dense white appressed hairs on stem. Glandular hairs on base of calyx only.	Almost hairless leaves, marginal teeth not very prominent	Shortly petiolate to sessile, sometimes shortly decurrent	Petals 4-7 mm, pinkish purple	Stolons to 25 cm long from late summer, matted by spring
Epilobium palustre	Club shaped	Round, scarcely any raised ridges	Stem often with sparse appressed non glandular and fewer patent glandular hairs near top	Strap shaped. 0.4-1.0 cm wide, narrowed to base, occ with crisped hairs	Sessile,or with petiole up to 4 mm	Flowers 4-6 mm across, pale pink or lilac	Small plant. Overwintering by small tight buds on ends of thread-like stolons

Epilobium parviflorum	4 lobed but usually suberect	Round	Hairy stem with patent glandular and non glandular hairs	Upper lvs densely hairy with surface felting, sessile, not decurrent, rounded at base	Stalkless or shortly petiolate	Petals 5-9 mm pale purplish pink	Overwintering by **short** leafy stolons.
Epilobium roseum	Club shaped	4 raised ridges (2 distinct, 2 indistinct)	Stem hairless below, with crisped hairs and spreading glandular hairs above	Nearly hairless, elliptical pointed lvs, taper to long stalk	Long petiole up to 20 mm	White in bud, pink after fertilisation	Overwintering by subsessile leaf rosettes, plant rarely forming thin stolons.
Epilobium tetragonum	Club shaped	4 raised ridges	Stem crisped hairy especially on angles. No glandular hairs anywhere.	Narrowly lanceolate, lvs glabrous above, with a few hairs on midrib, marginal teeth fairly prominent	Sessile, maybe decurrent onto stem ridges	6-10 mm diam, pale purplish pink	No or limited stolons (not more than 10 cm) with plant forming rosettes in autumn
Epilobium lanceolatum	4 lobes	Round	Sparsely hairy, with more or less appressed non glandular hairs and more or less patent glandular hairs	Sparsely toothed except at base, gradually narrow to petiole	Petiole (2) 4-10 mm	Petals 6-9 mm, pink	Overwintering as short stolons ending in leaf rosettes

Galeopsis angustifolia – Red Hemp-nettle in Shropshire, just…

Ruth Dawes

This annual member of the *Lamiaceae* family has lovely deep pink flowers and, as its specific name suggests, narrow leaves. It is classed as an archaeophyte and is a predominantly southern and lowland species in England. Belonging to the European temperate element, it also occurs in western, central and southern Europe. The Red Hemp-nettle has been known to grow on arable land, open ground, limestone pavement, maritime sand or shingle, and occasionally on the sand and gravel of eskers; mostly on calcareous soils in well-drained and warm places. It is a poor competitor.

In Shropshire there are old records for Oswestry quarries, the base of the Wrekin, Redhill, Shrewsbury, Presthope and Kenley from the 1800s. It was even classed as "rather frequent around Much and Little Wenlock". Sadly, by the time of the 1985 *Shropshire Flora* there were no records. The only relatively recent records are a few plants on scree at Jones' Rough at Nantmawr, first spotted by C Johnson in 1987; a handful of plants on a roadside verge at Diddlebury and increasing numbers (now four figures) in chippings in an industrial yard at Llanymynech, on the east side of the main road, so just in Shropshire. The plants at Jones' Rough were last officially recorded by Michael Porter and Michael Foley in 2000, but some Shropshire botanists believe they have seen them in more recent times; there have been no further records from Diddlebury since Mary Fuller found them in 1992. The Llanymynech population, in introduced limestone chippings, was first spotted by Franklyn Perring in 1992 in double figures. So…. where did the chippings come from? Local quarries?

Formerly a common cornfield weed in some areas, but following a shift from spring to winter sown crops and cleaner crop husbandry, this species has drastically declined and there is a strong contraction in range since the 1962 national Atlas. Red hemp-nettle germinates and flowers late (July to September) so this annual is hit by stubble clearance before it has set seed on arable land. Reported as being "rather common in arable land in south and east England" in *CTM*, it was moved into "Scarce" in the First Edition of *Stace*'s New Flora of the British Isles, 1991. However, its dramatic decline in locations and contraction of range has resulted in the species being included in the 2014 Vascular Plant Red Data List for England, having suffered at least 80% decline in its English sites. It is classed as particularly vulnerable and endangered in arable land.

Local floras and recorders indicate that there are no modern records for Montgomeryshire, Denbigh, Flintshire, Radnorshire, Cheshire, Herefordshire or the Black Country so our single known population at Llanymynech is very important to the region. Kew Seed Bank staff have commented that although "they can germinate the seeds, they have difficulty bringing the seedlings on – a work in progress" so this may indicate other complications in the reproductive cycle. The fact that our healthy Shropshire population is in a warm, open site, with little competition, where it can successfully set abundant good seeds, may make it a nationally important community. The plants can easily be seen without trespassing from the canal bridge and towpath in Llanymynech (see photo back cover).

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Ten Targets for Conservation in Shropshire - an Update

Mags Cousins

Five years ago the leading conservation partners in Shropshire put together a list of the top ten priorities for conservation and this was first presented in the Spring 2011 Edition of the Shropshire Botanical Society newsletter Five years later seems like a good time to review the progress which is given below on the original top ten, in the same order with no changes to the Targets 1-10.

Fortuitously during the last three years (until March 2015) White Mere, Cole Mere and Brown Moss were encompassed by the Defra-funded Nature Improvement Area Meres and Mosses project which helped provide people and funding to drive forward some of the actions which were needed on the top sites. Also there has been funding through the imperative of the Water Framework Directive to improve water quality which paid for works that could not be covered by Natural England's agri-environment schemes. By meshing these various resources, and working together, tree felling, silt trapping and drain blocking have taken place – actions which were decades overdue.

Perhaps it is time to change the focus to different sites. The original ones where most progress has been made could be placed on a 'watch list' whilst we monitor the success or not of the interventions and take on new sites for the focus of activity. As members of the conservation community, take a moment to consider the list.

It is pleasing to report that on several sites significant actions have been taken, in some cases we are entering a period of maintenance management, because all has been done that can be done for the time being using the tools that we currently have available. Ramping up the interventions on some sites will have to wait until policy change increases the influence of conservation.

Target 1. "Reporting the evidence and publish results of the interventions" – Monitoring and reporting the effectiveness of hard won actions often takes second fiddle to tackling the next problem but is essential for informing future management decisions and is certainly on my list of things to do (Ed.)! Monitoring programmes have been set up such as fixed point photography; quadrats and transects across hydrologic gradients where tree felling and/or ditch bed level raising has taken place; also regular aquatic macrophyte survey; water quality and water level monitoring; sediment capture and phosphate load analysis are all taking place, but admittedly the write ups are lagging behind. It will be beneficial when these are written up, especially for the practitioners who can benefit from each other's experiences. By joining forces with our partners in Staffordshire and Cheshire and with plenty of case studies and we could fill our own volume of Conservation Evidence just with the Meres and Mosses, see www.conservation-evidence.com.

Target 2. Brown Moss – "take the gloves off, bring out the bulldozers and get the site grazed". Shropshire Council can be congratulated on having fenced the site, no mean feat as this required a submission to the Secretary of State for the Environment as the site is a Registered Common. With good fencing in place the next problem was finding a grazier and it is only now after a concerted combined effort have two or three 'interested' graziers come to light but no domestic animals other than vast numbers of dogs have yet been on site. Most of the first phase of scrub removal by volunteers and contractors in accordance with the management plan (2011-2016) which was consulted and agreed with locals and professionals, has also taken place. The next phase, pushing back the trees from the margins of the

majority of the pools by 5-10 m and creating some corridors through the secondary woodland, will take place this autumn/winter and soon after, the bulldozers will be on starters orders to remove silt from three of the pools. The return of light and stripping nutrient rich organic sediment will hopefully see the return of some of the important species in particular Annex II species *Luronium natans* Floating Water-plantain which has not been seen since 2006.

Target 3. Wem Moss – "the solution is pretty straightforward – cut down lots of trees, get it grazed (preferably with cattle), keep the water level high". Shropshire Wildlife Trust has felled more trees and put more plastic sheet piling in place to hold rainwater on what is left of the dome of the bog. Properly resolving the water level issue is much harder to enforce as the surrounding land is drained and improved and incentives for the landowners to block ditches and return land to wetland are insufficient at the moment. Official protection for whole catchments to restore the hydrology of water-dependent designated sites is definitely required to overcome the limitations of the sticking plaster approach that is currently all we can do without the cooperation of surrounding land owners. As for grazing, it's not impossible but very tricky and definitely not a situation for 'normal livestock' management. A hardy breed of sheep would be the preferred choice of grazing animal. Highland sheep grazed the site one autumn but unfortunately the grazier did not return the following year.

Data from NVC quadrats was collected over the whole site in 2014 and analysed using MAVIS and a transect with NVC quadrats across the bog was carried out this year but although the bog appears wetter, there have there have been few signs of improvement in the target NVC community - M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire.

Target 4. Earl's Hill – "Management would be relatively simple: cut back the scrub and graze the grassland". Another case of more easily said than done, but again progress has been made. With a grant from WREN, a substantial area of scrub and trees has been removed from the scree and acid grassland. This has opened up the site and already indicator species for the U1 community *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland such as *Teesdalia nudicaulis* Shepherd's Cress, *Filago minima* Small Cudweed and *Moenchia erecta* Upright Chickweed have been recorded in the newly cleared areas. Grazing however has been very problematic even with a new tenant. Despite this drawback, the grassland on all areas of the reserve has improved in condition this year, including the MG5 *Cynosurus cristatus-Centaurea nigra* neutral grassland areas, which for two years had showed a decline in axiophyte frequencies.

Target 5. Haughmond Hill – "take the conifers off again" and "ideally, manage it as a deer park". The Forestry Commission have been less than enthusiastic about this prospect, particularly with their own targets for woodland cover in the last few years. In about 2009 nearly 11 hectares of conifers in two main blocks were clear-felled. Sadly the opportunity for habitat restoration was lost as these have since been replanted. A temporary benefit of this was that Nightjar were heard using the newly opened up area. Then in 2013 another 11 hectare block was felled and the original plan was to replant but the good news is they are now likely to leave it to develop naturally. They would ideally like to fence and graze this area but currently don't have the resources to do so. The area has some interesting wetter habitat with *Scutellaria minor* Lesser Skullcap and *Molinia caerulea* Purple Moor-grass so it will be fascinating to see how this area progresses. The conservation community should all think how we could encourage FC to manage this as open wetland habitat as it is unlikely that the deer will keep on top of recolonising trees here, as elsewhere on the site the scrub is continuing to encroach onto the acid grassland and heath. Perhaps Haughmond Hill could be

targeted for conservation management by the newly formed Shrewsbury Branch of the Shropshire Wildlife Trust.

Target 6. Prees Branch Canal – "All that needs to be done is to manage the canal as a canal again. Lay the hedges, mow the towpath, keep the channel watertight, dredge it every now and then. But don't allow any boats to run down there with their propellers turning. Just drag them along with horses as a treat for tourists." The reserve is now owned and managed by the Canals and Rivers Trust with monitoring and advice on management by SWT. Dredging the canal is a very costly business but SWT are delighted to report that dredging took place last autumn. Alders were also coppiced along a section of the reserve where shading was a negative factor on the aquatic macrophytes. The canal is to be surveyed in August this year. Cutting of the towpath has always been part of the annual management of the reserve but there are no plans for the introduction of tourist boats (a barrier at the marina end prevents access).

Target 7. Cole Mere – "cutting down trees" to help the *Nuphar pumila* Least Water-lily. Shropshire Council and volunteers organised by the Meres and Mosses project have made good progress here and the two extant *Nuphar* populations are still present and have possibly expanded in response to increased light. There is a slight problem with the second exhortation "Why not go for a Victorian-style promenade, with a mown lawn around the margin". The problem being the vast numbers of dogs that are encouraged by their owners to romp into the water after sticks etc at the slightest opportunity, so the shore has had to be barricaded with piles of spiky brash to discourage them – not conducive to mowing or grazing. Ideally there would be much more tree felling around other parts of the shoreline which would spread the impact of disturbance in the water and provide more opportunities for the *Nuphar* to colonise/recolonize other parts of the mere. Natural England have just secured some funding to study the *Nuphar* here to learn more about the ecology of the species.

Target 8. Moelydd and Jones's Rough – "spend some money via the agricultural schemes and subsidies that are available" on scrub and bracken control and establish suitable grazing. Jones's Rough is a Shropshire Wildlife Trust reserve and a Higher Level Stewardship scheme has facilitated some positive management; much of the encroaching bramble has been eaten off by Hebridean sheep and the nationally rare sedge *Carex muricata* spp. *muricata* Prickly Sedge appears to have spread. Another axiophyte *Galeopsis angustifolia* Red Hemp-nettle was last recorded on the scree in 2000 (see p 15 for a profile of this species). The agri-envrionment schemes are voluntary, so willingness to participate and subsequent engagement to get the management right is always a potential show stopper on non designated sites. Unfortunately the main landowners of Moelydd have not taken up agri-environment schemes yet.

Target 9. White Mere – "try out restoration techniques" to restore some of the axiophytes. This site has had a lot of investment in the last four years; substantial tree felling from the shore; reversion of more of the arable land in the catchment to grassland; diversion of septic tank effluent; diversion of the main road drain carrying huge amounts of silt into a primary silt trap and secondary swale (see photo below); and installation of timber drop boards on the artificial outlet as a means of raising and lowering water levels to ensure marginal wetland such as the carr in Mere Wood is gets flooded but drawdown can also occur for the *Eleocharis acicularis* Needle Spike-rush. Where trees have been removed marginal wetland vegetation is re-establishing, such as *Iris pseudacorus* Yellow Flag, *Veronica beccabunga* Brooklime, *Lythrum salicaria* Purple-loosestrife and *Scutellaria galericulata* Skullcap. The silt trap installed last year has already captured nearly 300 mm of sediment which previously

poured straight into the mere from the road. This has been analysed and contains high levels of phosphates and contaminants (Pb, Cu, Zn, Cr) that exceed draft guidelines by the EA for channel sediments. Any beneficial effects of these measures on the true aquatics could take a long time to become apparent. The mere was surveyed for aquatics at the end of June this year, during a thick "algal bloom", but even so the usual suspects were discovered – *Potamogeton pusillus* Lesser Pondweed, *P. crispus* Curled Pondweed and *Ranunculus circinatus* Fan-leaved Water-Crowfoot.

Target 10. Cramer Gutter – "still drying up and scrubbing over. The hedges around the edge are now 20 m tall and the trees are sucking the water out of the ground. Remove the pond and create a muddy watering hole instead". The objective here is to save the *Gentiana pnemonanthe* Marsh Gentian and a host of other interesting wetland species.
The problem is not the hedge but the ditches at the top of the reserve which were dug sometime in the past and the plan is to now block these. The fence has now been removed from around the pond and it has indeed become a 'muddy watering hole' covered in *Lyrthrum portula* Water Purslane. Scrub cutting took place in the autumn of 2014 and Welsh hill sheep grazed the reserve in early summer along with the two ageing Highland cattle that inhabit the site all year round. The valley mires continue to proliferate in *Narthecium ossifragum* Bog Asphodel, *Eleocharis quinqueflora* Few-flowered Spike-rush, *Vaccinium oxycoccus* Cranberry and *Drosera rotundifolia* Round-leaved Sundew. Twelve *Gentiana pnemonanthe* were counted in early August this year.

Conclusion

I think we can say genuine progress has been made on management at most of the target sites, although improvements to the axiophytes and vegetation communities will take longer to become apparent and in most cases the sites still suffer from ecological isolation. 2016 could be the year to revisit the targets and tackle new challenges, though without allowing progress to slip on the original ones.

With thanks for contributions from Fiona Gomersall and Dan Wrench.

White Mere SSSI: Poplar plantation before and after felling and construction of silt trap and swale beside the A528.

What is happening at Catherton Common

Hilary Wallace and Kate Thorne

We would like to address a few of the issues raised by Alex Lockton's article in the summer newsletter. Firstly, that the methodology of previous surveys was flawed in favour of predetermined diagnoses of the vegetation communities present and secondly that H4 humid heath cannot be present at Catherton Common.

The absence of records for H4 (*Ulex gallii-Agrostis curtisii* humid heath), M15 (*Scirpus cespitosus-Erica tetralix* wet heath) and M19 (*Calluna vulgaris-Eriophorum vaginatum* blanket mire) in Shropshire, apart from M19 on the Long Mynd (Rodwell 1991)) and M15 at Catherton (Thorne 2010, Lockton and Whild 2015), suggests that, in the less oceanic climatic zone of Shropshire, there is likely to be consistent variation in the vegetation composition of these humid and wet heaths compared to that described in the published text.

The article by Lockton provides a misleadingly simplistic solution to what is an interesting ecological conundrum at Catherton Common, which has a rich and varied series of vegetation communities. The suggestion that the whole site can now, following use of a magical Twinspan analysis, be classed as M15 (*Scirpus cespitosus-Erica tetralix* wet heath) seems to go contrary to all previous, and more recent, presentations of vegetation survey data from the site. These indicate that dry, humid and wet heath and mire are all present. Without floristic tables arising from the TWINSPAN of Lockton it is hard to comment on the outcome – but H8, M19 and two subcommunities of both H4 and M15 all appear to be present on the site (Thorne & Thorne 2013, Alexander 2014, Wallace 2015).

Soils at Catherton vary from humic rankers and shallow peaty gleys on the upper slopes through deeper peats over sandy substrates to deep peats on some of the north-facing slopes towards Cramer Gutter. It is ecologically very unlikely that these different soils will all support the same vegetation community. Past management of the site through burning and over grazing blurs some of the distinctions, and has probably resulted in loss of bryophytes, especially species of *Sphagna*, but patterns of variation in the constant species on these different soils are still apparent. One consequence of the burning is the appearance of frequent *Campylopus introflexus* and, locally, *Sphagnum compactum*.

The only way to be sure what community one is in is to construct constancy tables based on a minimum of five quadrats for each different recognisable stand of vegetation – fail to do this and one has little hope of solving the problem – how else does one decide what the communities are? Many surveys provide too few quadrat records for construction of meaningful constancy tables and MATCH scores for individual quadrats are inherently unreliable. Analyses like Twinspan are only going to work if there are sufficient quadrats from each of the range of community types present to form discrete endgroups.

In many situations TWINSPAN can help; that presented by Alexander illustrated the Shropshire 'humid heaths' forming a grouping only separated from the Cornish samples by their lack of *Agrostis curtisii.* It would be interesting to see the resulting constancy tables from the combined analysis presented in this and Lockton's article. It is not uncommon to get site-specific divisions in a classification if data are from very disparate areas and the suspicion here is that more divisions might indeed have identified other vegetation units at Catherton.

The vegetation at Catherton is not particularly species poor, with a range of 5-20 species/quadrat in the survey data available. The suggestion that the small number of common species that make up these vegetation communities has led to the wrong conclusions in their classification misses the point of how the NVC works.

Most vegetation communities are characterised by common species, but it is the joint occurrence of these common species that defines the community. In the case of H4 it is the joint occurrence of the dry species *Ulex gallii, Calluna vulgaris* and *Eric cinerea* together with the more damp loving *Erica tetralix* and *Molinia caerulea,* plus *Potentilla erecta,* that strongly suggests a humid heath rather than a wet heath. These six species do not occur constantly together in any of the subcommunities of M15 – the closest is M15c but even here *Ulex gallii* should not be present.

In fact, if MATCH constantly comes up with high scores for something you think it can't be then it is probably something that hasn't been described formally in the NVC, but has close affinities with something that has. A lovely example of this occurs on wet floodplain meadows; a short, species-rich, sedge-dominated vegetation consistently scored highest in MATCH for SD17 (a dune slack grassland) – so whenever a high MATCH score for SD17 appeared it indicated a particular sedge-dominated vegetation type (Prosser and Wallace 1996). This was formalised and a new damp grassland community was recognised (Rodwell *et al.* 2000, Cox and Leach 1995). New vegetation types are not erected without due consideration, and only accepted once they have been recorded from a number of different sites. So, the constant appearance of H4 at the top of the match outputs (as occurred on Catherton Common in Thorne's original survey) suggests there is something new that needs describing.

So, let's not put all of our humid heaths without *A.curtisii* into M15 but pool the quadrat data that have the combined constants of H4 and see what it tells us.

The absence of *Agrostis curtisii* need not be seen as preventing recognition of humid heath; whether it is seen as a new subcommunity of H4 outwith the geographic range of *A. curtisii* (Rodwell suggests this in his review of vegetation, Rodwell et al. 2000) or just a slightly different form of H4 as described in the Grasslands of Wales (Stevens et al. 2010) isn't really relevant. The fact that humid heath vegetation lacking *A.curtisii* has been recorded as H4 throughout the SW of England and Wales, outwith the range of *A.curtisii* into N. Wales, suggests a new subcommunity is needed.

Nearly 150 ha of H4 were recorded during the lowland grassland survey of Wales (Stevens *et al.* 2010) at 33 sites, 29 of these being in Pembrokeshire and one in Ceredigion. Similar stands have been recorded on heathland complexes as far north as Anglesey (Prosser and Wallace 1995).

If this vegetation is seen to extend into Shropshire then an analysis of the combination of all vegetation that MATCH thinks might be H4 should be considered and a proper TWINSPAN run to tease out variation within the humid heath, rather than shoehorning it into a wet heath.

The cross-European framework, of which the British vegetation forms a part, is unlikely to be completely re-written in the future. To suggest that a completely different classification of the British vegetation communities might occur in the future seems a gross over reaction to the current status of the classification. There will be revisions, new vegetation types will occasionally be described, and the distribution of communities will change as climate change and land management fashions change.

In a European context, Ellenberg (1988) distinguishes 'moist sand heaths' of the *Genisto-Callunetum Molinietum*, occurring on gleyed podzols, to which H4 is related, from 'swamp heaths' of the order *Erica-Sphagnetalia papillosi* from more peaty profiles which would include M15.

So, do we have a humid (moist) heath without *A.curtisii* or a wet (swamp) heath with *Ulex gallii* and *Erica cinerea*. I suspect the answer is both – some areas on the drier, western margins of Catherton Common and especially west of the road at Upper Marsh (SJ640787), where peat is shallow, are probably best seen as a form of humid heath where all the constants (except *A.curtisii*) are indeed constant. Other areas may be a new form of wet heath with constant *Ulex gallii* and *Molinia caerulea*; in time these might become humid heaths as peat is constantly depleted by burning and erosion. On the wetter soils M15a or M25a rather than M21 are probably the best solution to stands rich in *Narthecium* and *Ulex gallii,* although the results, on analysis, are very close.

The summary floristic table (Table 1) presents data from 6 stands of vegetation, sampled using standard NVC methodology (i.e. 5 quadrats each of 2x2 m area) in August 2015. They are clearly different from each other, some 'fit' the NVC quite well, but most are slightly ambiguous. The final diagnosis is very similar to that of Thorne's 2010 survey (Table 2).

Does it matter? Yes it probably does.

Ulex gallii is a scarce western species in the European context and is limited in its distribution to Great Britain, Ireland, western France and northwest Spain. If one has dry heath (H8) or humid heath (H4) there is a presumption that *U.gallii* should be there and management will be geared to maintaining the species – albeit with some control. If one maps everything as M15, then *U. gallii* will be seen as an invading species to be controlled or eradicated.

If the M15 is becoming H4 through mis-management then priorities for site management have to be made so that a balance of communities can then be arrived at – but this isn't possible if one doesn't know what one has, what the target communities are and how best to maintain them.

Ulex gallii, Erica cinerea, E.tetralix and Molinia caerulea at Catherton Common, photo H.Wallace, 2015

Table 1. Constancy classes in each column (I-V) based on 5 quadrats sampled within homogeneous stands of vegetation accompanied by maximum cover values (1-100). Each quadrat was 2x2 m in area and cover values were assigned using visual estimates of percentage cover. Species present at Constancy I in a single column omitted for clarity. Columns are arranged according to increasing peat depth (reflecting increasing soil moisture retention). Data collected in August 2015. Species diagnostic of the different heathland NVC units defined at Catherton indicated in red (humid heath), green (wet heath) and purple (blanket bog). Blue indicates common to humid and wet heath

	humid heath				wet heath				bog			
Stand number	2		1		3		6		5		4	
1. Closest NVC unit	**H4a**		**H4d**		**M15b/d**		**M15a**		**2. M19a**		**3. M15d burnt**	
Calluna vulgaris	**V**	**30**	**V**	**10**	**III**	**1**	**V**	**40**	**III**	**15**	**V**	**55**
Molinia caerulea	**V**	**65**	**V**	**75**	**V**	**70**	**V**	**90**	**IV**	**50**	**V**	**60**
Erica tetralix	**II**	**10**	**IV**	**25**	**V**	**40**	**V**	**40**	**V**	**35**	**V**	**60**
Potentilla erecta	**II**	**2**	**V**	**3**	**V**	**10**	**IV**	**5**				
Vaccinium myrtillus	**V**	**2**	**V**	**5**	**IV**	**5**			**V**	**90**	**V**	**70**
Hypnum jutlandicum	**IV**	**2**	**V**	**3**	**II**	**2**	**III**	**20**	**IV**	**10**		
Ulex gallii	**V**	**90**	**V**	**50**	IV	20	V	50				
Erica cinerea	**V**	**15**	**IV**	**15**								
Scirpus cespitosus			**IV**	**10**	**V**	**10**	I	4				
Carex panicea			**IV**	**2**	**V**	**8**	II	2				
Sphagnum papillosum			I	3	**V**	**40**						
Sphagnum tenellum			III	10	**IV**	**5**			II	3		
Polygala serpyllifolia	II	2	II	1	**IV**	**3**	**I**	**1**				
Juncus squarrosus			I	5	**IV**	**2**					II	10
Odontoschisma sphagni					**II**	**1**						
Narthecium ossifragum					**II**	**8**	**V**	**90**				
Juncus acutiflorus					**I**	**1**	**V**	**10**				
Sphagnum palustre					**I**	**3**	**V**	**10**				
Sphagnum recurvum					**II**	**5**	**III**	**5**				
Drosera rotundifolia							**IV**	**1**				
Calypogeia fissa							**IV**	**5**				
Carex echinata							**III**	**3**				
Eriophorum angustifolium							**III**	**15**				
Eriophorum vaginatum							I	2	**V**	**15**		
Leucobryum glaucum									**V**	**10**	I	1
Sphagnum capillifolium			I	10			II	20	**IV**	**10**	I	20
Deschampsia flexuosa	III	20	I	1	I	2			**V**	**30**	III	2
Dicranum scoparium			I	2	I	3			**V**	**10**	I	1
Aulocomium palustre					V	3	II	2	**V**	**3**	III	10
Sphagnum compactum			III	30								
Carex pilulifera	V	20	III	3	I	3					I	3
Agrostis vinealis	III	15	IV	15	V	35	II	2				
Nardus stricta	III	50	IV	10	V	40			I	2		
Campylopus introflexus	III	2	II	2	I	1			I	1	II	20
Danthonia decumbens	II	2	II	5	III	3						

Table 2. Summary of stands surveyed in 2015. Stand locations, soil type, management, MATCH scores and final allocation. Results of Thorne 2010 survey included for comparison.

Stand		1	2	3	4	5	6
GR		SO 62916 78633	SO 62989 78624	SO 63312 78564	SO 64283 78836	SO 64394 98932	SO 64648 79270
Soil		Peaty gley	Humic ranker	Peaty gley	Peaty gley (sandy)	Peaty gley (sandy)	DP
Management		Recently burnt	Recently burnt		Recently burnt		
	MATCH	M15c 65.5	H4a 65.9	M15d 59.8	H4c 50.2	M19a 58.1	M21b 66.7
		H4c 62.7	H8e 56.0	M15b 52.0	M15d 49.6	H12a 51.9	M25a 64.4
						M15d 49.8	M15b 61.5
	Final	H4(b/d)	H4(a)	M15b/d	M15d	M19a	M25a/M15b
Thorne	**polygon**	41	40	26	9c	8	1A
Thorne	**NVC**	H4d/M15	H4c	H4d/M15	M15/H9a	M19a	M21b
Thorne	**Qs**	33, 34	32, 35	36, 37	17,18	19,20	6, 24-27

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Plant introductions at Llynclys Quarry

Dan Wrench

Work to enhance biodiversity in Llynclys Quarry (previously also known as Whitehaven Quarry) has been going on since around 2004 when Aggregates Levy Sustainability Funding (ALSF) was first used to clear scrub which was covering limestone grassland, install fencing to create grazing plots and create new hedgerows.

In 2009 additional funding from ALSF was used to create a pool and wetland area in an old dried up siltation lagoon – 'Lagoon 1'. The spring 2010 edition of the Shropshire Botanical Society Newsletter describes some of this work in more detail including the first introductions of species in September 2009. These introductions were via fen hay from the nearby Sweeny Fen SSSI. Hay was cut and, on the same day, strewn on the bare mud areas surrounding the new pool in Lagoon 1 in the hope that seed will have been transported with the hay.

By 2010 two rare plants for the county had already established: *Triglochin palustris* L., Marsh Arrowgrass and *Juncus subnodulosus* Schrank, Blunt-flowered Rush. Hay was strewn again in 2010 and 2011 with the following additional species becoming established: *Zannichellia palustris* L., Horned Pondweed, *Eleocharis palustris*, Common Spike-rush, *Juncus acutiflorus* Ehrh. ex Hoffm., Sharp-flowered Rush, *Typha latifolia* L., Bulrush, *Mentha aquatica* L., Water Mint and *Potamogeton natans* L., Broad-leaved Pondweed.

Since 2011 additional species likely to have come over with the hay include *Filipendula ulmaria* (L.) Maxim., Meadowsweet, *Molinia caerulea* (L.) Moench, Purple Moor-grass, *Valeriana dioica* L., Marsh Valerian and *Cirsium palustre* (L.) Scop., Marsh Thistle.

Figure 1. Marsh Valerian first found in 2015

Species that had found their own way into the wetland area included *Carex flacca* Schreb. Glaucous Sedge, *Carex hirta* L., Hairy Sedge, *Calliergonella cuspidata* (Hedw.) Loeske, Pointed Spear-moss, and *Pellia endiviifolia* (Dicks.) Dumort. Endive Pellia and *Cephaloziella* sp.

Discussion between the author and Iain Diack (Senior Wetland Specialist for Natural England) led to comparison of this embryonic wetland habitat with M13 *Schoenus nigricans* – *Juncus subnodulosus* mire (Rodwell, 1991). It just so happened that Iain had several young plants of *Schoenus nigricans* L., Black Bogrush growing in his back garden; grown up from seed collected at Anglesey. So plans were hatched to see if planted *S. nigricans* would do well in the developing mire at Llynclys.

For reference the constant species listed by the National Vegetation Classification for M13 are listed in the table below with notes on the local context:

M13 constant species	Already present at Llynclys?	Notes
Carex panicea	Yes	Not common in lagoon 1 area.
Juncus subnodulosus	Yes	Well established – dominant in places
Schoenus nigricans	No	
Molinia caerulea	Yes	Recent arrival – 2014 or 2015
Calliergon cuspidatum	Yes	Abundant over most of area
Succisa pratensis	?	Rare in Llynclys Quarry probably not in Lagoon 1 area
Potentilla erecta	?	Not recorded in area for some time
Campylium stellatum	?	Not recorded in area

On 17th October 2014 Dan Wrench, Iain Diack and Gareth Egarr (of Shropshire Wildlife Trust) visited the Lagoon 1 area of Llynclys Quarry with around 30 young plants of *S. nigricans* and a range of other vascular plants and bryophytes. The table below gives the details of all plants introduced in 2014. More precise details on location are available on request. The central grid reference for Lagoon 1 is SJ264239.

Species	Vernacular name	Number planted out	Provenance	Notes
Schoenus nigricans	Black Bogrush	Approx 30	Anglesey	Placed in two main areas both near the main pool and at edge of wetland
Carex rostrata	Bottle Sedge	1	Berrington Moss, Shropshire	Pushed into the mud in water 20 cm deep
Potamogeton gramineus	Various-leaved Pondweed	1	Dowrog Common, Pembrokeshire	Only a tiny piece around the base of the *Carex rostrata*
Menyanthes trifoliata	Bog Bean	1	Dowrog Common, Pembrokeshire	Placed in the main pool in water 20 cm deep
Potamogeton coloratus	Fen Pondweed	2	Shapwick Heath, Somerset	Placed in the *Eleocharis palustris* swamp
Calliergon giganteum	Giant Spear-moss	1	Stapeley Common, Shropshire	Placed in small ephemeral pool near main pool
Scorpidium cossonii	Intermediate Hook-moss	3 strands	Long Mynd, Shropshire	Placed with *Schoenus nigricans* at the northern edge of the wetland area

Whether M13 mire is created or not is not important but it would be interesting to see if the Black Bogrush does establish. This ongoing work also allows us the opportunity to further reduce the vulnerability of some locally rare or uncommon species of base-rich mire. Species such as *Trollius europaeus* L., Globe Flower, *Pedicularis palustris* L, Marsh Lousewort, *Sagina nodosa* (L.) Fenzl, Knotted Pearlwort, *Eriophorum latifolium* Hoppe, Broad-leaved Cottongrass and *Carex dioica* L., Dioecious Sedge. While some interesting species have

already started to colonise from Sweeny Fen it might also be interesting to collect seed from other nearby sites like Trefonen Marshes SSSI and Blodwell Marsh SSSI.

An additional visit was made by the author and Iain Diack on 20th August 2015. This time around 20 young plants of *Succisa pratensis* Moench, Devil's-bit Scabious were planted in one main area at the edge of the wetland with a couple of plants closer to the main pool. These plants were sourced from Bagmere and Hughley in Shropshire. *S. pratensis* is known elsewhere at Llynclys Quarry but not in Lagoon 1. In addition seeds of *Serratula tinctoria* L., Saw-wort, sourced from Edgmond, Shropshire were placed in similar places to the *S. pratensis*.

A brief search was made for the previous introductions but so far only the single plant of *Carex rostrata* was found. A more thorough search is planned for summer 2016.

The rationale for these introductions is that this area is a relatively new surface, created when a siltation lagoon dried out. We are not altering existing habitat of any great worth but we may help create an interesting habitat which could provide an arc site for a few uncommon or rare species. There seems to be little chance the introduced species could spread outside the quarry – at least in the short term.

Figure 2. Iain Diack planting Schoenus nigricans at the edge of the wetland area with Gareth Egarr taking notes

Figure 3. View near the main pool showing the existing vegetation of *Carex flacca* and *Calliergonella cuspidata* with willow scrub.

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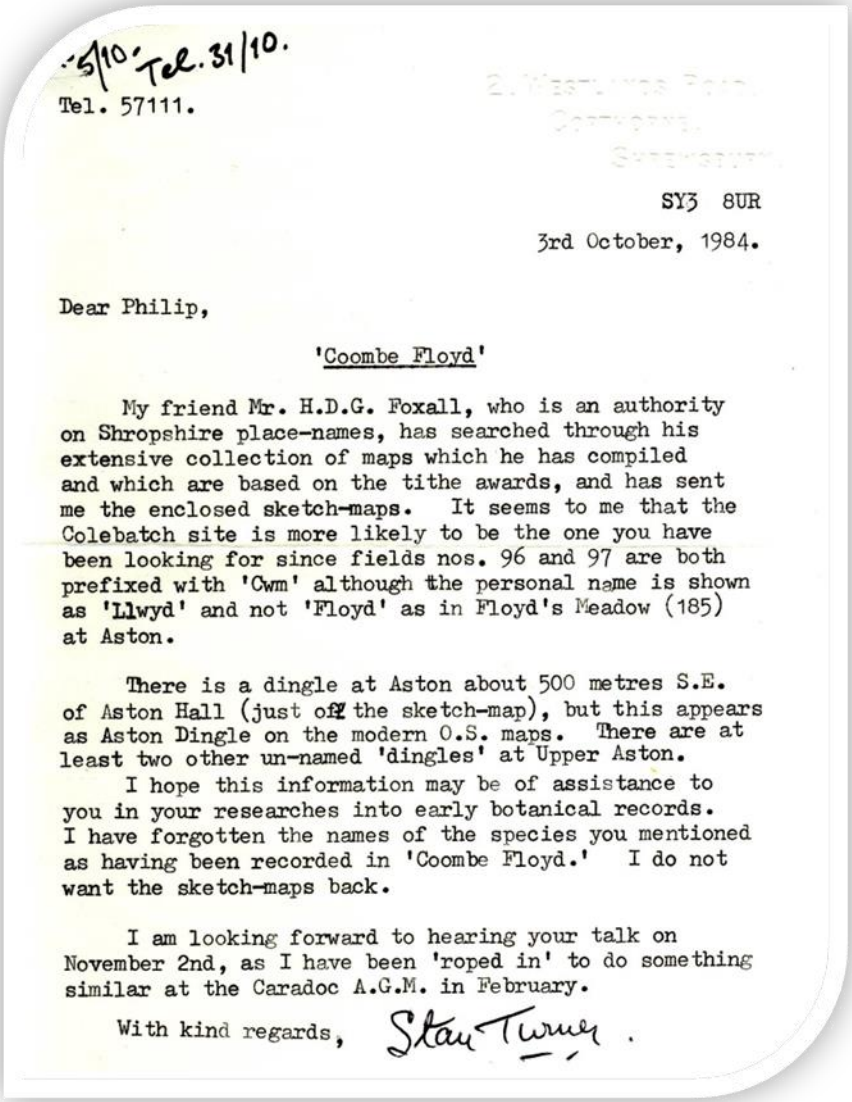
The Location of Cwm Floyd

Alex Lockton

In 1726 Littleton Brown (1699-1749) of Bishops Castle wrote a letter to Johann Jacob Dillen (aka Dillenius) in which he mentioned that he had found *Rubus saxatilis* (Stone Bramble), *Solidago virgaurea* (Goldenrod) and *Athyrium filix-femina* (Lady Fern) at Cwm Floyd. I have never been quite sure where Cwm Floyd was, and it seems that others have been just as perplexed, because I recently found the following letter in some correspondence belonging to Philip Oswald. It is worth reproducing here.

I agree with Stan Turner that the Colebatch site is the more likely one. This would make Cwm Floyd synonymous with The Dingle, Colebatch, at SO2986 and SO3086. It is a small dingle running down from Blakeridge Wood, and it seems a likely place for *Rubus saxatilis* to have occurred. It might even be worth searching that area for it again.

Our procedure is to use the modern names of sites in the database, so the records by Brown will subsequently be assigned to The Dingle, Colebatch (although Cwm Lloyd is a more appealing name), while the comment will preserve the original description.



5/10 Tel. 31/10.
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SY3 8UR

3rd October, 1984.

Dear Philip,

'Coombe Floyd'

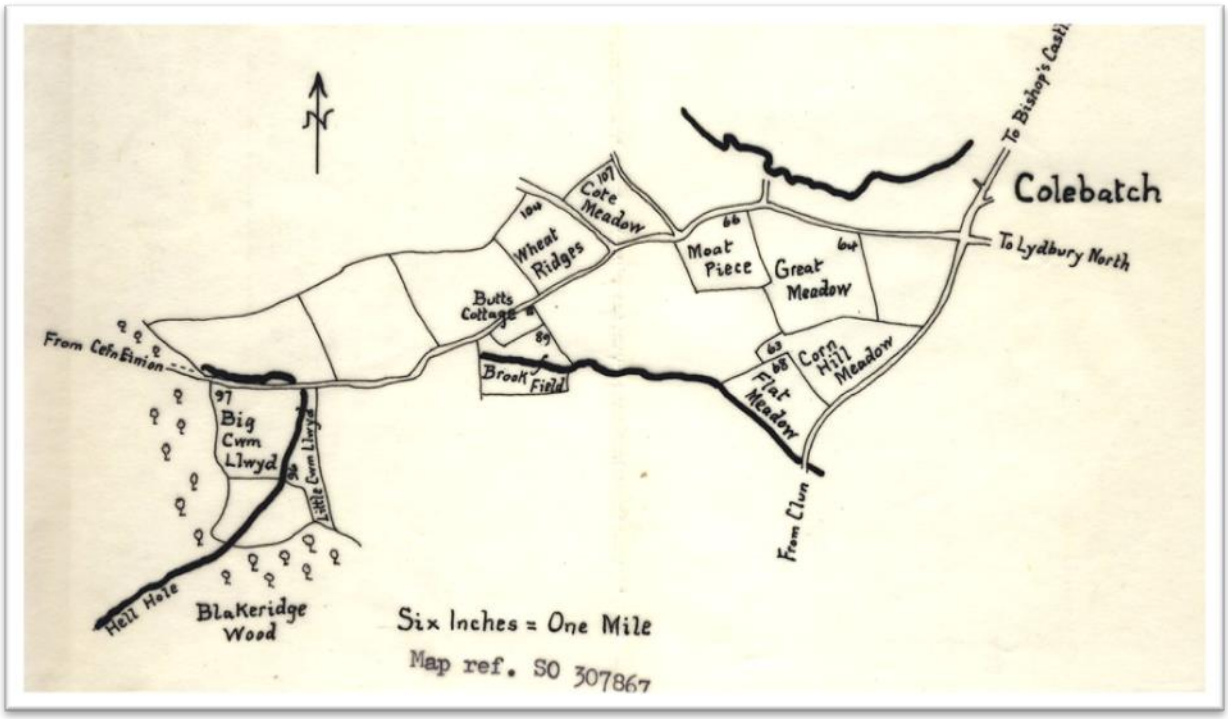
My friend Mr. H.D.G. Foxall, who is an authority on Shropshire place-names, has searched through his extensive collection of maps which he has compiled and which are based on the tithe awards, and has sent me the enclosed sketch-maps. It seems to me that the Colebatch site is more likely to be the one you have been looking for since fields nos. 96 and 97 are both prefixed with 'Cwm' although the personal name is shown as 'Llwyd' and not 'Floyd' as in Floyd's Meadow (185) at Aston.

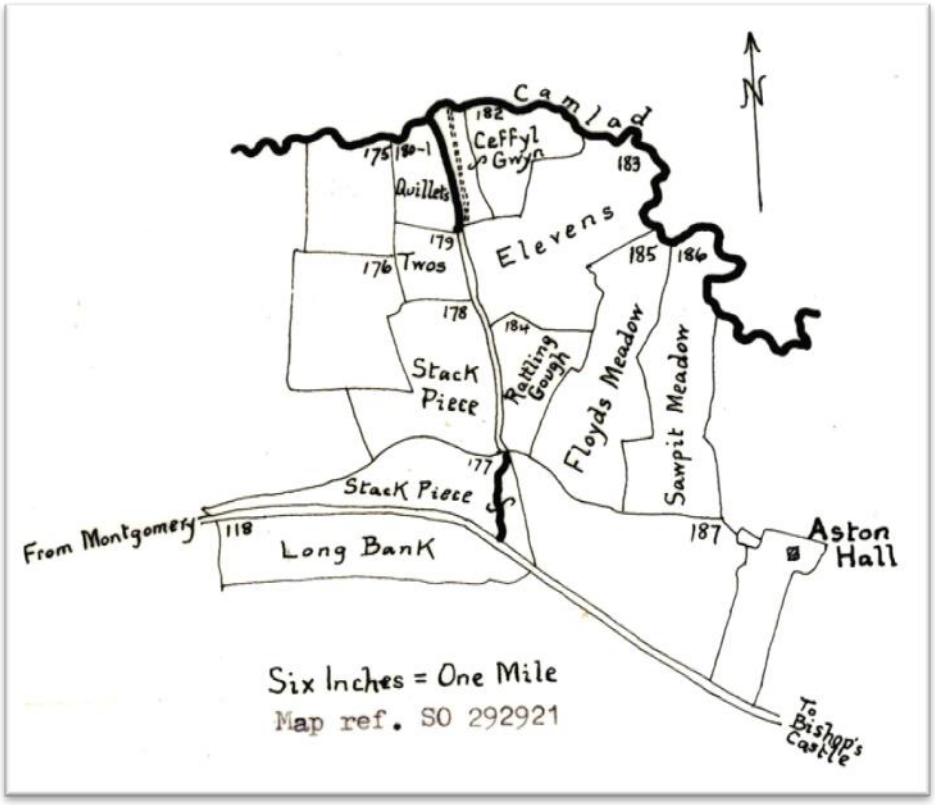
There is a dingle at Aston about 500 metres S.E. of Aston Hall (just off the sketch-map), but this appears as Aston Dingle on the modern O.S. maps. There are at least two other un-named 'dingles' at Upper Aston.

I hope this information may be of assistance to you in your researches into early botanical records. I have forgotten the names of the species you mentioned as having been recorded in 'Coombe Floyd.' I do not want the sketch-maps back.

I am looking forward to hearing your talk on November 2nd, as I have been 'roped in' to do something similar at the Caradoc A.G.M. in February.

With kind regards, Stan Turner.





Sketch maps by H.D.G. Foxall of possible locations for Cwm Floyd.

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Galeopsis angustifolia Red Hemp-nettle by the Canal Bridge, Llanymynech, photo R.Dawes, 2015

Epilobium brunnescens New Zealand Willowherb, Ashes Hollow, photo D. Wrench, 2015